wherein the sensor is flexible and is adapted to provide an electrical signal that is substantially insensitive to relative motion between the implanted portion of the sensor and tissue surrounding the implanted portion of the sensor.

2 ~~32.~~ (New) The analyte sensor of claim ~~31~~ 1, wherein the analyte is glucose.

3 ~~33.~~ (New) The analyte of sensor of claim ~~31~~ 1, wherein the sensing layer comprises a non-leachable, analyte-responsive enzyme.

4 ~~34.~~ (New) The analyte sensor of claim ~~33~~ 3, wherein the sensing layer further comprises a hydrogel.

5 ~~35.~~ (New) The analyte sensor of claim ~~33~~ 3, wherein the sensing layer further comprises a non-leachable redox compound.

6 ~~36.~~ (New) The analyte sensor of claim ~~31~~ 1, wherein the sensor has no leachable components.

7 ~~37.~~ (New) The analyte sensor of claim ~~32~~ 2, further comprising a diffusion-limiting layer disposed over the sensing layer.

8 ~~38.~~ (New) The analyte sensor of claim ~~37~~ 7, wherein the diffusion-limiting layer is adapted to limit the rate of glucose transport to the sensing layer to be substantially lower than the rate of glucose transport to the tissue surrounding the sensor.

9 ~~39.~~ (New) The analyte sensor of claim ~~37~~ 7, further comprising a biocompatible layer disposed over the diffusion-limiting layer.

10 ~~40.~~ (New) The analyte sensor of claim ~~39~~ 9, wherein the biocompatible layer comprises poly(ethylene oxide).

11 ~~41~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the working electrode has a width of no more than about 0.25 mm.

12 ~~42~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the portion of the sensor that is adapted for subcutaneous implantation has a width of no more than about 0.29 mm.

13 ~~43~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the working electrode is adapted to provide a signal of current density of at least about 69 $\mu A/cm^2$ at 37°C at a glucose concentration of 10 mM.

14 ~~44~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the sensor is adapted to have a 10 to 90% response time of not more than about 30 seconds at a glucose concentration of about 20 mM.

15 ~~45~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the sensor is adapted to provide a current signal deviating not more than about 5% from its average value for at least 72 hours after equilibration when glucose concentration is maintained at 10 mM.

16 ~~46~~. (New) The analyte sensor of claim ~~32~~ 2, wherein the glucose response through the 2 to 20 mM glucose concentration range is close to linear.

17 ~~47~~. (New) The analyte sensor of claim ~~46~~ 16, wherein the sensor has substantially no signal output when the concentration of glucose is zero.

18 ~~48~~. (New) A glucose measurement system comprising:

a sensor configured to generate a signal indicative of the glucose concentration, the sensor comprising:

a non-corroding working electrode adapted for subcutaneous implantation in an animal, and

a sensing layer comprising a non-leachable glucose-responsive enzyme disposed on the working electrode; and

a signal measuring device operatively connected to the sensor for measuring the signal generated by the sensor, the signal measuring device being configured to allow the signal generated by the sensor to reach a basal signal level for a predetermined period of time before the signal is used as an indicator of the glucose concentration.

19 ~~49~~. (New) The glucose measurement system of claim 18 ~~48~~, wherein the working electrode has a width of no more than about 0.25 mm.

20 ~~50~~. (New) The glucose measurement system of claim 18 ~~48~~, wherein the sensor has a width of no more than about 0.29 mm.

21 ~~51~~. (New) The glucose measurement system of claim 18 ~~48~~, wherein the working electrode is adapted to provide a signal of current density of at least about 69 $\mu A/cm^2$ at 37°C at a glucose concentration of 10 mM.

22 ~~52~~. (New) The glucose measurement system of claim 18 ~~48~~, further comprising a diffusion-limiting layer disposed over the sensing layer.

23 ~~53~~. (New) The glucose measurement system of claim 18 ~~48~~, wherein the sensor is adapted to have a 10 to 90% response time of not more than about 30 seconds at a glucose concentration of about 20 mM.

24 ~~54~~. (New) The glucose measurement system of claim 18 ~~48~~, wherein the sensor is a glucose sensor and is adapted to provide a current signal deviating not more than about 5% from its average value for at least 72 hours after equilibration when glucose concentration is maintained at 10 mM.

25 ~~55~~. (New) An introduction system for a glucose sensor, comprising:

an introducer adapted for subcutaneous placement of a portion of a flexible glucose sensor in an animal, and

a portion of a flexible glucose sensor carried within the sensor introducer, the portion of a flexible glucose sensor comprising:

a non-corroding working electrode adapted for subcutaneous implantation in an animal, and

a sensing layer comprising a non-leachable, glucose-responsive enzyme disposed on the working electrode;

wherein the introducer can be withdrawn from the animal while leaving the portion of a flexible glucose sensor implanted within the subcutaneous tissue of the animal.

26
~~56.~~ (New) The introduction system of claim 25, wherein the introducer is adapted to aid insertion of the sensor into the abdomen of the animal.

27
~~57.~~ (New) The introduction system of claim 25, wherein the working electrode has a width of no more than about 0.25 mm.

28
~~58.~~ (New) The introduction system of claim 25, wherein the portion of the flexible glucose sensor carried within the sensor introducer has a width of no more than about 0.29 mm.

29
~~59.~~ (New) A method of measuring the concentration of glucose in an animal tissue, the method comprising the steps of:

(a) implanting into the animal a flexible sensor configured to generate a signal indicative of the concentration of glucose, the sensor comprising:

a non-corroding working electrode adapted for subcutaneous implantation in an animal; and

a sensing layer comprising a non-leachable glucose-responsive enzyme disposed on the working electrode;

(b) connecting a signal measuring device to the sensor;

(c) allowing the signal generated by the sensor to reach a basal signal level for a predetermined period of time; and

(d) measuring the glucose concentration using the signal generated by the sensor after step (c).

30 ~~60~~. (New) A method of measuring the concentration of glucose in an animal tissue, the method comprising the steps of:

(a) subcutaneously implanting into the animal a flexible sensor configured to generate a signal indicative of the glucose concentration, the sensor comprising:

a non-corroding working electrode adapted for subcutaneous implantation in an animal,

a sensing layer comprising a non-leachable glucose-responsive enzyme disposed on the working electrode, and

a glucose diffusion-limiting layer disposed on the sensing layer;

(b) allowing the glucose to reach the working electrode; and

(c) limiting the rate of glucose transport to the sensing layer to a level substantially lower than the rate of glucose transport to the tissue surrounding the sensor.

31 ~~61~~. (New) A method for inserting a flexible glucose sensor, comprising:

(a) providing an introducer having a width of not more than about 22 gauge adapted for subcutaneous placement of a portion of a flexible, glucose sensor in an animal;

(b) placing within the introducer a portion of a flexible, glucose sensor, the portion of a flexible, glucose sensor comprising:

a non-corroding working electrode adapted for subcutaneous implantation in an animal, and

a sensing layer comprising a non-leachable, glucose-responsive enzyme disposed on the working electrode;

(c) inserting the introducer into the animal so that the portion of the flexible, glucose sensor is carried into the subcutaneous tissue;

(d) withdrawing the introducer from the animal while leaving the portion of a flexible glucose sensor implanted within the subcutaneous tissue of the animal; and

(e) connecting a signal measuring device to a portion of the sensor exterior to the animal.

32 ~~62~~. (New) The method of claim 31 ~~61~~, wherein the working electrode has a width of no more than about 0.25 mm.

33 ~~63~~. (New) The method of claim 31, wherein the portion of the flexible glucose sensor implanted within the subcutaneous tissue of the animal has a width of no more than 0.29 mm.

34 ~~64~~. (New) A flexible glucose sensor comprising:

a portion of the sensor that is adapted for positioning external to the animal and for electrical contact with a device for measurement of the electrical signal generated by the sensor;

a portion of the sensor that is adapted for subcutaneous implantation in an animal, comprising:

at least one non-corroding, glucose-responsive working electrode; and

a sensing layer coupled to the working electrode;

wherein the sensor is flexible and the width of the portion of the sensor that is adapted for subcutaneous implantation is less than about 0.29 mm.

35 ~~65~~. (New) The flexible glucose sensor of claim 34, wherein the sensing layer comprises a non-leachable, analyte-responsive enzyme.

36 ~~66~~. (New) The flexible glucose sensor of claim 35, wherein the sensing layer further comprises a hydrogel.

37 ~~67~~. (New) The flexible glucose sensor of claim 35, wherein the sensing layer further comprises a non-leachable redox compound.

38 ~~68~~. (New) The flexible glucose sensor of claim 34, wherein the sensor has no leachable components.

39 ~~69~~. (New) The flexible glucose sensor of claim 34, further comprising a diffusion-limiting layer disposed over the sensing layer.

40 ~~70.~~ (New) The flexible glucose sensor of claim ~~69~~ 39, wherein the diffusion-limiting layer is adapted to limit the rate of glucose transport to the sensing layer to be substantially lower than the rate of glucose transport to the tissue surrounding the sensor.

41 ~~71.~~ (New) The flexible glucose sensor of claim ~~69~~ 39, further comprising a biocompatible layer disposed over the diffusion-limiting layer.

42 ~~72.~~ (New) The flexible glucose sensor of claim ~~69~~ 39, wherein the biocompatible layer comprises poly (ethylene oxide).

43 ~~73.~~ (New) The flexible glucose sensor of claim ~~64~~ 34, wherein the working electrode has a width of no more than about 0.25 mm.

44 ~~74.~~ (New) The flexible glucose sensor of claim ~~64~~ 34, wherein the working electrode is adapted to provide a signal of current density of at least about 69 $\mu A/cm^2$ at 37°C at a glucose concentration of 10 mM.

45 ~~75.~~ (New) The flexible glucose sensor of claim ~~64~~ 34, wherein the sensor is adapted to have a 10 to 90% response time of not more than about 30 seconds at a glucose concentration of about 20 mM.

46 ~~76.~~ (New) The flexible glucose sensor of claim ~~64~~ 34, wherein the sensor is adapted to provide a current signal deviating not more than about 5% from its average value for at least 72 hours after equilibration when glucose concentration is maintained at 10 mM.

47 ~~77.~~ (New) The flexible glucose sensor of claim ~~64~~ 34, wherein the glucose response through the 2 to 20 mM glucose concentration range is close to linear.